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ABSTRACT

A description of the geographic planning and operation of the 1990 U.S. Census presented in cartoon form, this booklet carries the user through the stages of the development of the materials needed for census field enumeration activities. Maps were drawn for address reference files, and geographic reference files were created. These cartoons follow the creation of the Tiger Data Base Files through planning, generating, design, and production stages. TIGER is an acronym for "topologically integrated geographic encoding and referencing." The cartoons are designed for classroom use in teaching about the census and geographic areas of the United States. (NL)

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BUREAU OF THE CENSUS

U.S. DEPARTMENT OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

A PRESENTATION OF THE AUTOMATED GEOGRAPHIC SUPPORT SYSTEM FOR THE 1990 CENSUS

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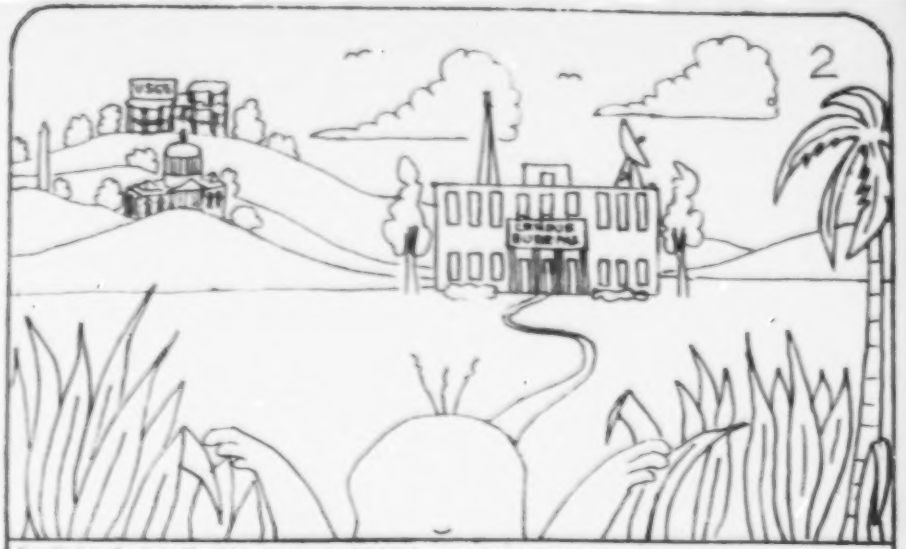
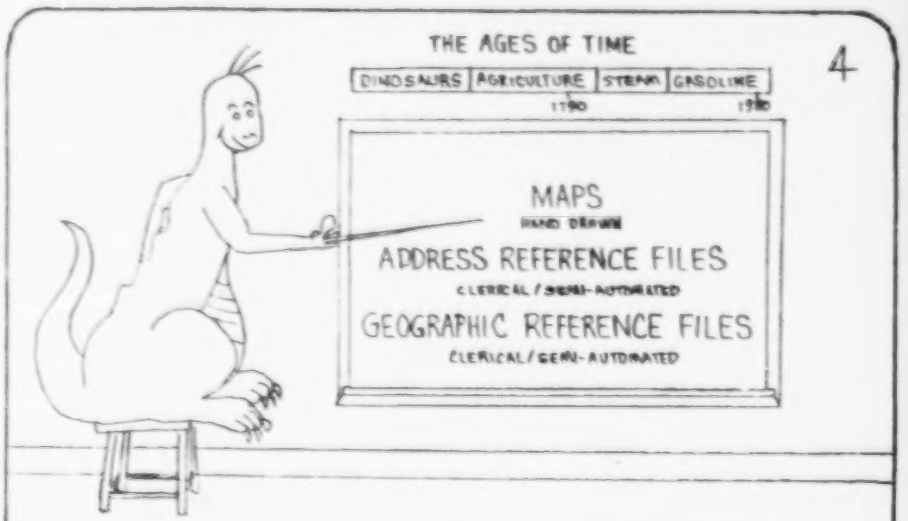
TIGER Tales was written and illustrated by Gerard Wong within the conceptual framework provided by Robert W. Marx, Chief, Geography Division. The work was performed under the direction of Barbara Hanis. Assistance was provided by John Pressler and A. Bertrand Chasson.

Issued February 1988



EMERGING FROM THE BUREAUCRATIC JUNGLE, BRONTO THE BRONTOSAURUS DISCOVERS AN INNOVATIVE INTERAGENCY PROJECT TO PRODUCE GEOGRAPHIC PRODUCTS FOR THE 1990 CENSUS.

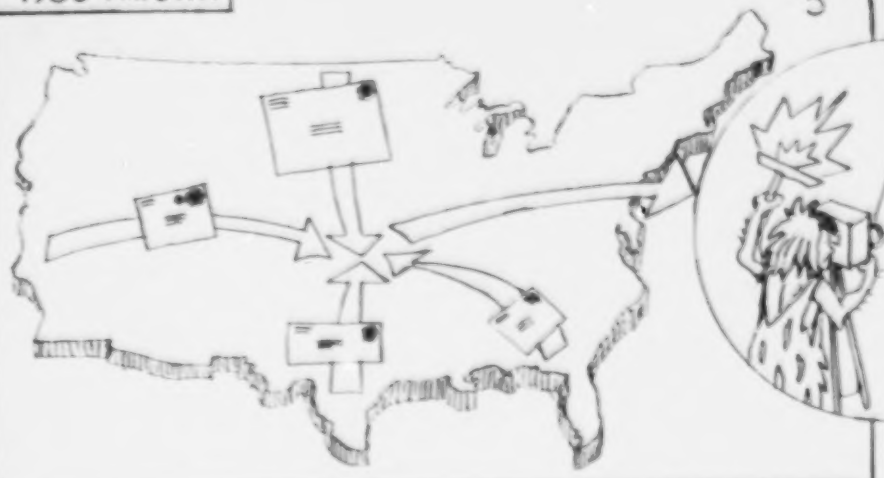
IT ALL BEGAN WHEN THE BUREAU OF THE CENSUS WAS PREPARING FOR THE 1980 CENSUS FIELD ENUMERATION ACTIVITIES. FOR THE CENSUS TO BE TAKEN AND TABULATED CORRECTLY, EACH HOUSING UNIT HAD TO BE ASSIGNED TO THE PROPER LOCATION IN THE UNITED STATES -- NORMALLY A CITY BLOCK -- AND EACH LOCATION HAD TO BE CLASSIFIED INTO ALL OF THE TABULATION UNITS RECOGNIZED IN THE CENSUS.



THREE GEOGRAPHIC PRODUCTS WERE CREATED TO SUPPORT 1980 FIELD WORK AND DATA TABULATION. THESE PRODUCTS ALL WERE CREATED USING TRADITIONAL CLERICAL PROCESSES; TWO OF THESE PRODUCTS WERE STORED IN COMPUTER FILES, AND ALL THREE HAD THEIR OWN IDENTITY.

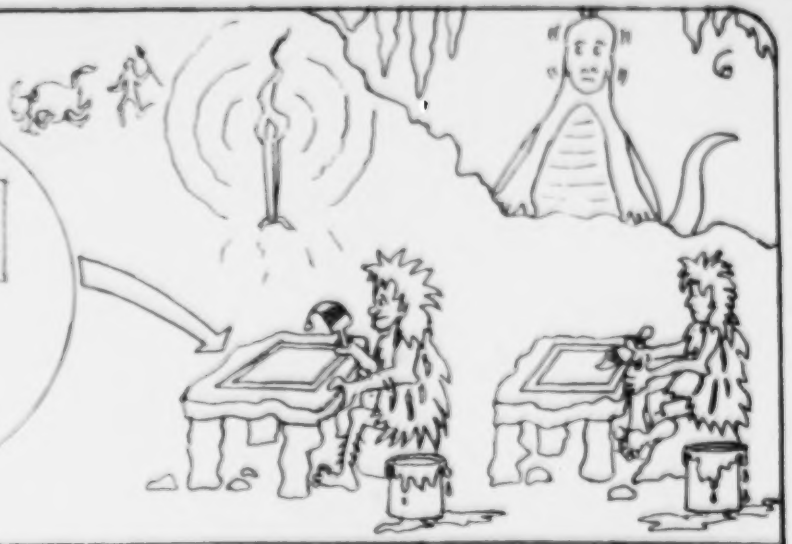
1980 MAPS....

5



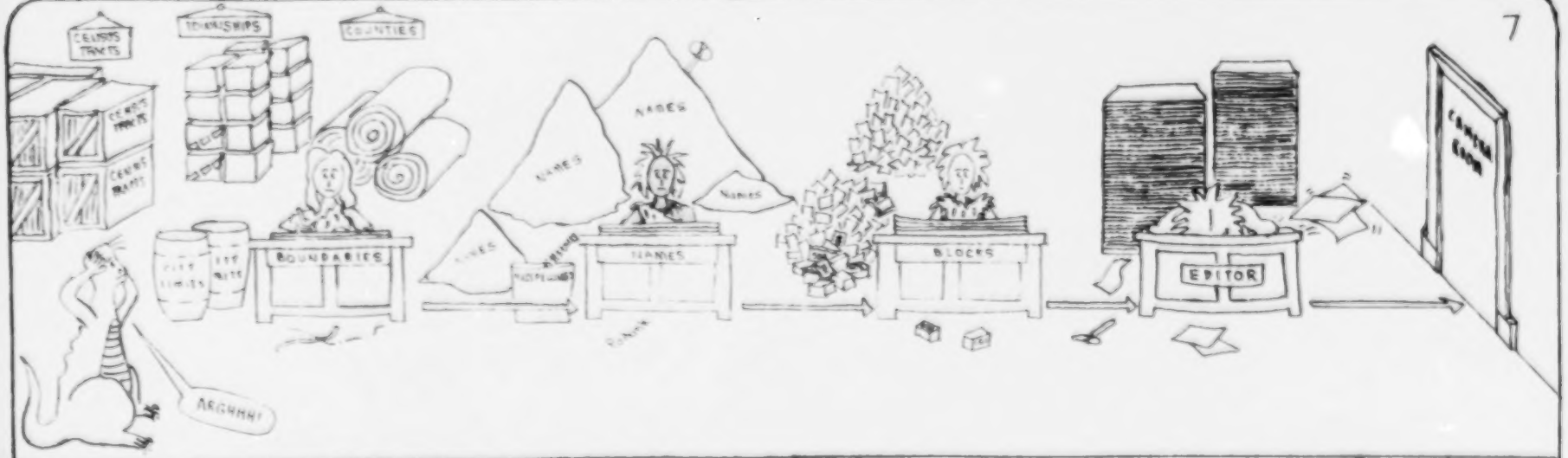
FOR MOST OF THE COUNTRY, BASE MAPS SHOWING ROADS, RIVERS, RAILROADS, AND SO FORTH WERE GATHERED FROM LOCAL OFFICIALS. MOST HAD DIFFERENT WAYS OF SHOWING THIS INFORMATION AND CAME IN A WIDE VARIETY OF SHAPES AND SIZES.

6

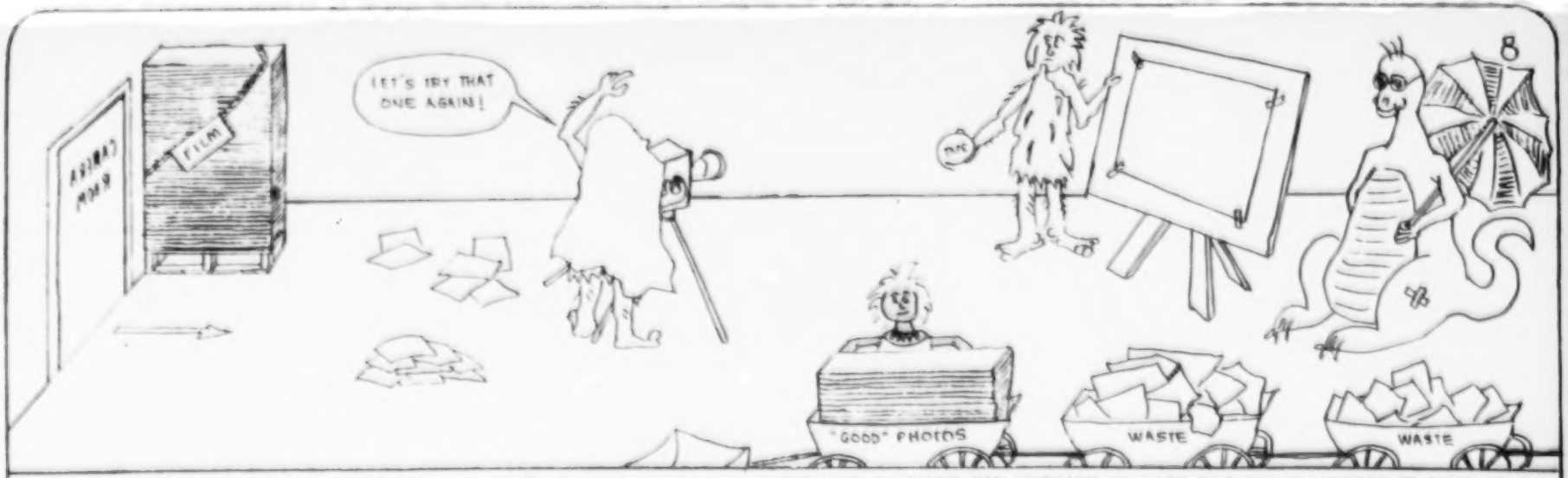


TO BEGIN PREPARING THESE 32,000 MAPS FOR CENSUS OPERATIONS, CENSUS BUREAU STAFF HAD TO PHOTOGRAPH EACH MAP AND PAINT OUT UNNECESSARY INFORMATION, SUCH AS ZONING CATEGORIES, LAND-USE PATTERNS, AND SO FORTH.

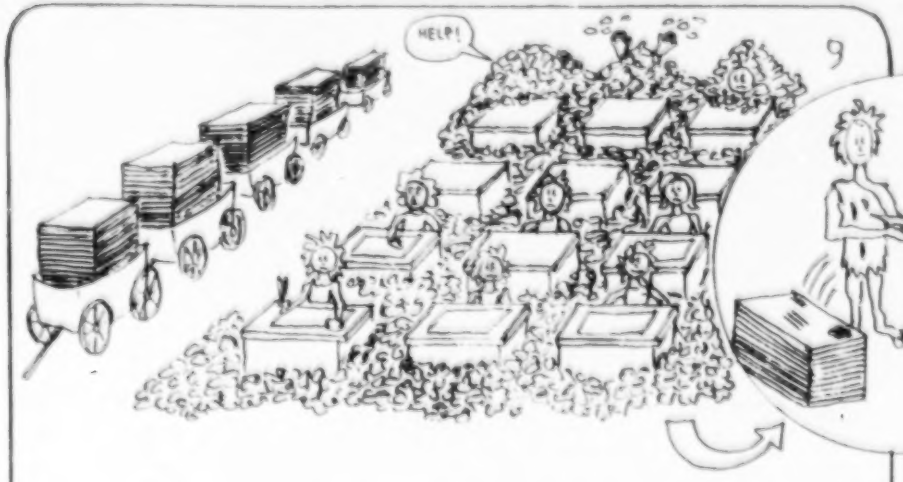
7



NEXT, THESE PEOPLE -- OVER 900 AT THE CENSUS BUREAU AND 300 AT A CONTRACTOR -- HAD TO PUT ALL THE BOUNDARIES ON THE MAPS TO DESCRIBE THE GEOGRAPHIC AREAS FOR WHICH THE 1980 DATA WOULD BE TABULATED. THEY ALSO HAD TO PUT ON THE NAMES OF ALL THESE AREAS -- NEARLY 65,000 AREAS, ALL SPELLED CORRECTLY -- PLUS OVER 45,000 CENSUS TRACT NUMBERS, MORE THAN 300,000 SEPARATE ENUMERATION DISTRICT NUMBERS, AND OVER 2,500,000 INDIVIDUAL BLOCK NUMBERS.



ALL THE OVERLAYS FOR EACH MAP SHEET THEN HAD TO BE PHOTOGRAPHED AND COMBINED TO MAKE THE VERSION OF EACH MAP SHEET NEEDED TO START CENSUS FIELD OPERATIONS. WHEN ERRORS WERE FOUND OR OTHER CHANGES WERE REQUIRED, THE WHOLE PROCESS HAD TO BE REPEATED.

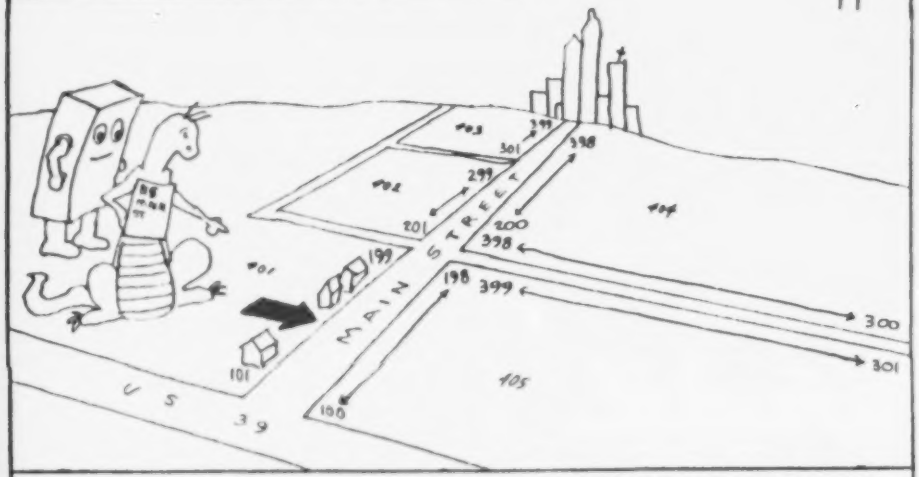


EACH OF THE 32,000 MAP SHEETS FROM THE PHOTOLAB THEN HAD TO HAVE MULTIPLE COPIES MADE SO THAT THE INDIVIDUAL ASSIGNMENT MAPS FOR EACH ENUMERATOR COULD BE PREPARED. SCISSORS AND TAPE WERE USED TO CUT OUT AND SPLICE TOGETHER MORE THAN 300,000 MAP COPIES SO THAT THE WHOLE U.S. WAS COVERED ONCE AND ONLY ONCE BY THIS HUGE JIG-SAW PUZZLE.

WHEN THE MAPS FINALLY WERE IN THE HANDS OF THE FIELD DATA COLLECTION STAFF, MANY PROBLEMS STILL REMAINED, BUT THE PROCESS TO REPAIR THE MAPS AT THAT POINT WAS SO LONG AND TEDIOUS THAT EVERYONE SIMPLY MARKED THE CHANGES ON THEIR OWN COPY. OUTSIDE THE MAJOR URBAN AREAS OF THE COUNTRY, THESE MAPS WERE USED BY THE FIELD STAFF TO ASSIGN EACH HOUSING UNIT TO ITS CORRECT LOCATION--A SPECIFIC BLOCK. THIS PROCESS IS CALLED MANUAL GEOCODING.

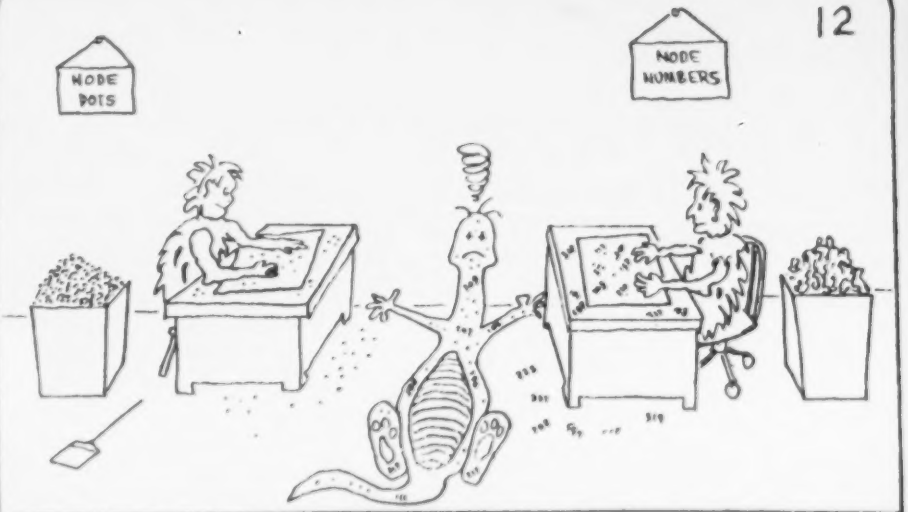
1980 ADDRESS REFERENCE FILES....

11



ADDRESS REFERENCE FILES WERE PREPARED FOR MAJOR METROPOLITAN AREAS BY STAFF IN OVER 300 LOCAL AGENCIES. ONCE DEVELOPED, THESE FILES ALLOWED CENSUS BUREAU COMPUTERS TO ASSIGN MOST HOUSES AND APARTMENTS FOR THE 1980 DECENNIAL CENSUS AND MOST BUSINESS ESTABLISHMENTS FOR THE 1982 ECONOMIC CENSUSES TO THE CORRECT CITY BLOCK. THIS PROCESS IS CALLED AUTOMATED GEOCODING.

12

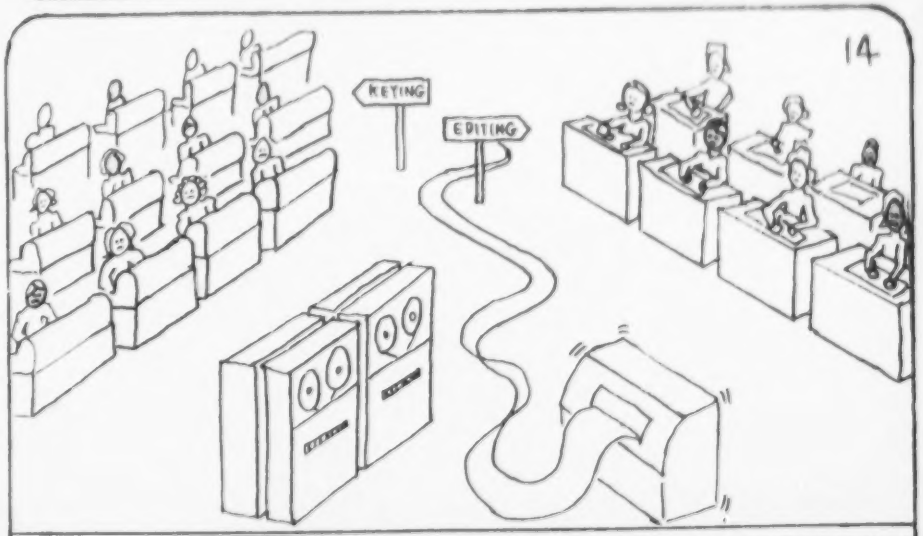


THIS PROCESS ALSO REQUIRED NUMEROUS CLERICAL PROCESSES. FOR 1980, THESE ADDRESS REFERENCE FILES WERE CALLED GBF/DIME-FILES. TO PREPARE THEM, EACH OF THE OVER 300 LOCAL AGENCIES HAD TO HIRE STAFF TO PUT NODE DOTS AT EVERY INTERSECTION ON THE MAPS AND THEN IDENTIFY EACH DOT WITH A NODE NUMBER.

13

AFTER APPLYING OVER 4,500,000 NODE DOTS AND OVER 4,500,000 NODE NUMBERS BY HAND, STAFF AT THESE SAME LOCAL AGENCIES HAD TO FILL OUT BY HAND OVER 7,000,000 LINES ON WORKSHEETS DESCRIBING EVERY SECTION OF STREET, RAILROAD, AND RIVER BETWEEN EACH PAIR OF NODE DOTS. THIS MEANT WRITING DOWN ALL THE SAME STREET NAMES, CENSUS TRACT NUMBERS, BLOCK NUMBERS, AND SO FORTH, THAT HAD BEEN PUT ON THE MAP SHEETS EARLIER.

14



EACH OF THOSE 7,000,000 LINES THEN HAD TO BE KEYED AND VERIFIED BEFORE GOING INTO THE COMPUTER WHERE VARIOUS EDITS WERE DONE AND LISTINGS OF ERRORS RETURNED FOR REVIEW, RETRANSCRIPTION, REKEYING, AND REEDIT. THIS CYCLE WAS OFTEN REPEATED AGAIN BEFORE THE FILES WERE CONSIDERED ACCEPTABLE FOR USE IN ASSIGNING MAILING ADDRESSES TO THEIR CORRECT LOCATION -- A CITY BLOCK.

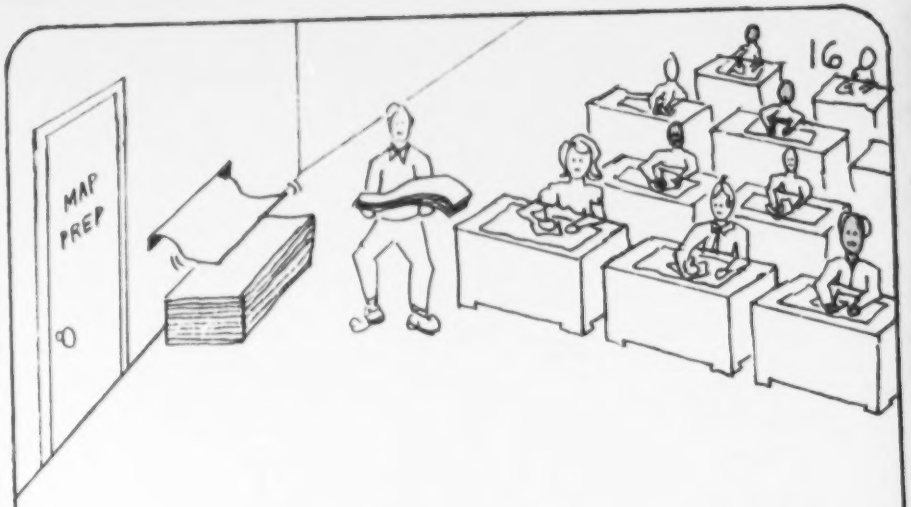
1980 GEOGRAPHIC REFERENCE FILES....

15

04 STATE (PREHISTORIC)
003 COUNTY (ARCHAIC)
015 MINOR CIVIL DIVISION (PTERODACTYL TWP.)
8837 PLACE (BRONTOSAURUS BOROUGH)
1162.01 CENSUS TRACT
0023 ENUMERATION DISTRICT
101 BLOCK

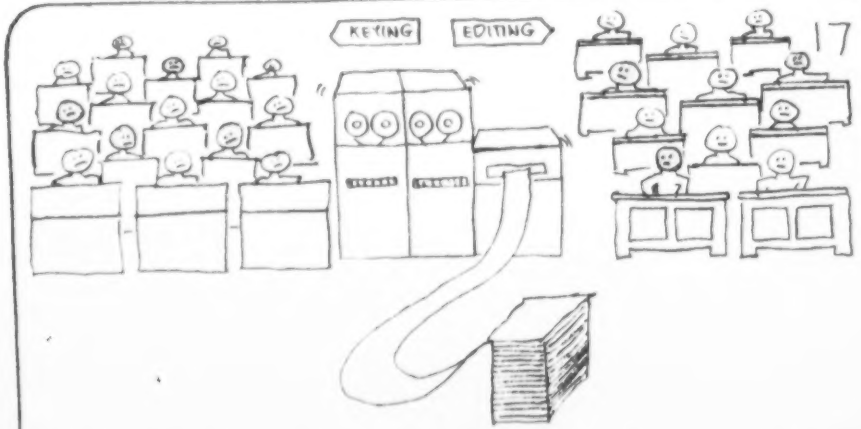
GEOGRAPHIC REFERENCE FILES WERE CREATED BY ANOTHER 300 CENSUS BUREAU WORKERS. THESE FILES WERE USED TO ASSIGN THE GEOCODED QUESTIONNAIRES TO ALL OF THE VARIOUS TABULATION AREAS, USING A HIERARCHY OF UNIQUE GEOGRAPHIC CODE COMBINATIONS AND GEOGRAPHIC NAMES.

16



THE CLERICAL PROCESSES USED TO CREATE THESE FILES FOR 1980 -- THEY WERE CALLED THE MASTER REFERENCE FILES OR MRFs -- FOLLOWED THE MAP PREPARATION STEP. NEARLY 300 PEOPLE COPIED ALL THE SAME GEOGRAPHIC AREA CODES AND BLOCK NUMBERS OFF THE MAPS AND ONTO ANOTHER SET OF WORKSHEETS.

17



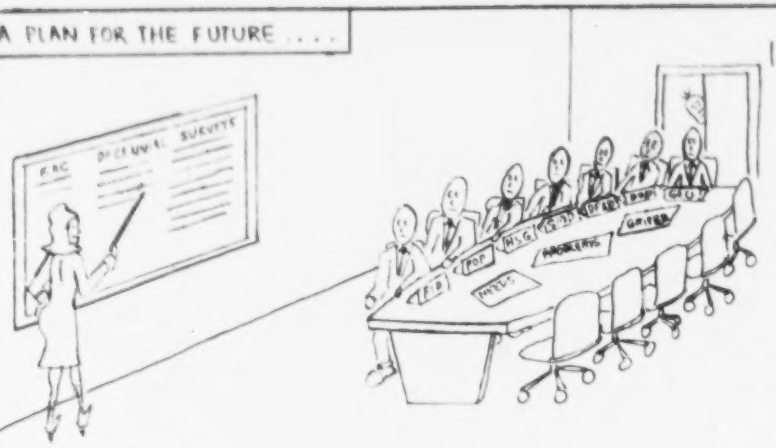
EACH OF THESE LINES ON THE WORKSHEETS HAD TO BE KEYED AND VERIFIED BEFORE GOING INTO THE COMPUTER. THE COMPUTER THEN EDITED THIS INFORMATION AGAINST OTHER EXISTING LISTS AND PRODUCED EDIT/REJECT LISTINGS. THESE LISTINGS WERE REVIEWED, REKEYED, AND EDITED SEVERAL TIMES, AND AGAIN EACH TIME A CHANGE OR CORRECTION WAS REPORTED.

18

DURING THE 1980 CENSUS, IT BECAME APPARENT THAT CONSTRUCTION OF THREE DISTINCT GEOGRAPHIC PRODUCTS THROUGH MASSIVE AND SEPARATE CLERICAL OPERATIONS RESULTED IN EACH PRODUCT DESCRIBING THE SAME PORTION OF THE EARTH IN A SLIGHTLY DIFFERENT WAY, WHICH HAMPERED FIELD OPERATIONS AND AFFECTED DATA PRODUCT QUALITY.

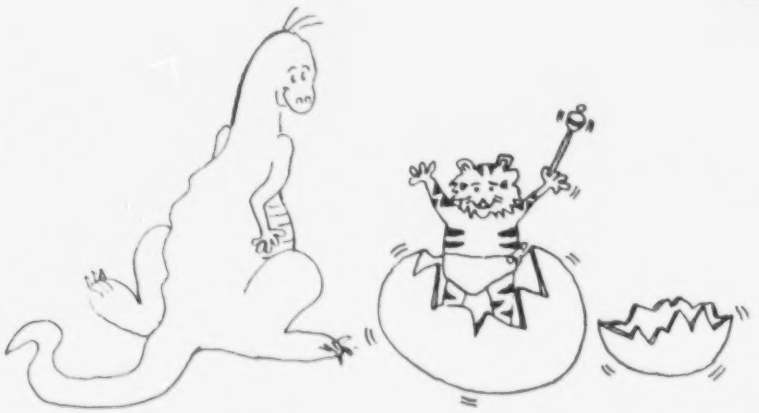
A PLAN FOR THE FUTURE . . .

19



TO DEVELOP A BETTER WAY TO PROVIDE THE REQUIRED GEOGRAPHIC SUPPORT FOR 1990, THE GEOGRAPHY DIVISION FIRST CONVENED A NUMBER OF MEETINGS, COMMITTEES, AND TASK FORCES TO DOCUMENT ALL OF THE GEOGRAPHIC PROBLEMS THAT EXISTED IN THE PAST AND DESCRIBE WHAT WAS NEEDED FOR THE 1990 DECENNIAL CENSUS, FUTURE ECONOMIC AND AGRICULTURE CENSUSES, AND CURRENT SURVEYS. FROM THESE MEETINGS, A PLAN WAS DEVELOPED FOR AN AUTOMATED SYSTEM TO MEET FUTURE NEEDS.

20



WHILE SOME PEOPLE THOUGHT THAT THE BUREAU OF THE CENSUS REALLY LAID AN EGG BASED ON THE 1980 EXPERIENCE, THE RESULT WAS THE EXTINCTION OF THE PREHISTORIC PROCESSES AND THE BIRTH OF A BOLD NEW GENERATION OF COMPUTER-BASED APPROACHES FOR TAKING THE 1990 CENSUS. THE GEOGRAPHIC COMPONENT OF THIS NEW GENERATION IS CALLED THE TIGER SYSTEM.

21

TOPOLOGICALLY
INTEGRATED
GEOGRAPHIC
ENCODING &
REFERENCING
System

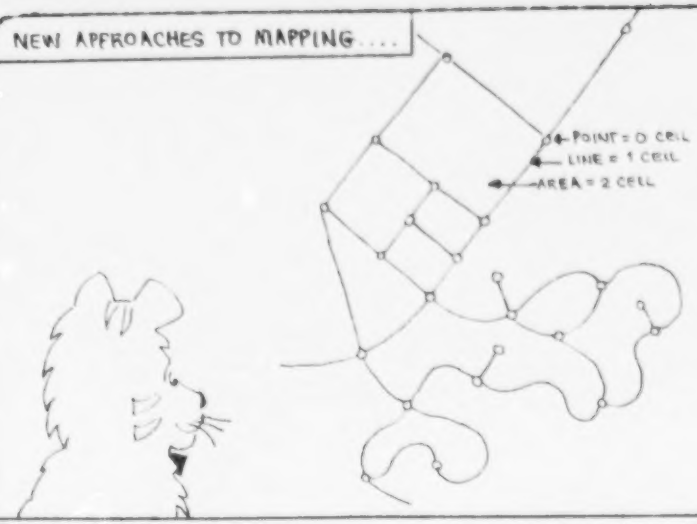
ALTHOUGH STILL IN ITS INFANCY, THE TIGER SYSTEM ALREADY SHOWS GREAT PROMISE. WHEN FULLY DEVELOPED, THE CENSUS BUREAU'S TIGER SYSTEM WILL SOLVE MOST OF THE PROBLEMS INHERENT IN PRODUCING GEOGRAPHIC SUPPORT PRODUCTS FOR 1980. THE TIGER FILE WILL PROVIDE GEOGRAPHIC PRODUCTS AND SERVICES FOR THE 1990 DECENNIAL CENSUS FROM A TOTALLY AUTOMATED SINGLE SOURCE. THIS MEANS THAT ALL MAPPING AND GEOPROCESSING WILL BE IN COMPLETE AGREEMENT.

22

ALL CENSUS GEOGRAPHY REQUIRED TO CONDUCT FIELD OPERATIONS AND TO TABULATE DATA WILL BE CONTAINED WITHIN THE TIGER FILE. THE MAP BASE NOT ONLY WILL CONTAIN ALL CENSUS AREAS BUT WILL SHOW ALL ROAD, RAILROAD, WATER AND OTHER BOUNDARY INFORMATION REQUIRED FOR THE CENSUS.

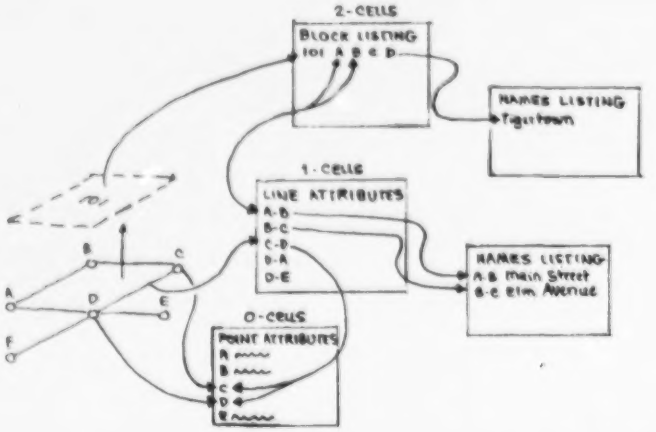
NEW APPROACHES TO MAPPING....

23



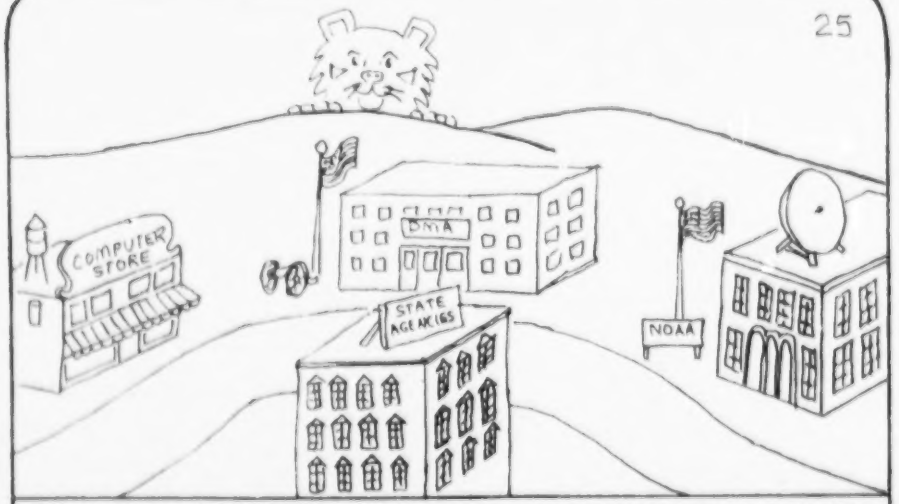
THE INTERNAL STRUCTURE OF THE TIGER FILE WAS CREATED APPLYING THE CONCEPTS OF TOPOLOGY, A BRANCH OF MATHEMATICS WHICH DESCRIBES THE SPATIAL RELATIONSHIPS OF POINTS, LINES, AND AREAS IN A TWO-DIMENSIONAL PLANE. CONSTRUCTION OF THE FILE USING THESE PRINCIPLES ALLOWS AN ELEGANT, POWERFULLY SELF-CHECKING COMPUTER DATA BASE TO BE FASHIONED THAT CONTAINS ALL MAPPED FEATURES AND BOUNDARIES, THEIR NAMES, ADDRESS RANGES, AND GEOGRAPHIC CODES.

24



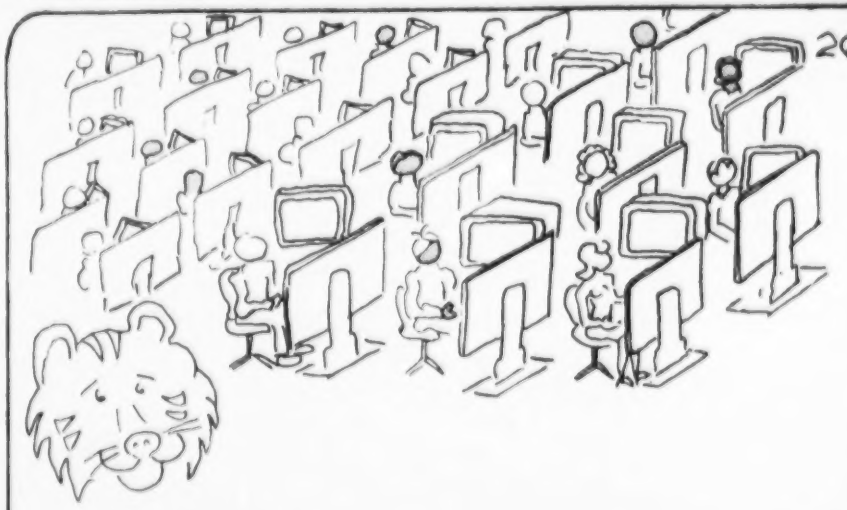
THE GEOGRAPHIC INFORMATION WILL BE STORED IN THE TIGER FILE USING LISTINGS AND DIRECTORIES LINKED AND CROSS-REFERENCED TO EACH OTHER BY ELECTRONICALLY THREADED POINTERS. LINE SEGMENTS AND POINTS WILL HAVE GEOGRAPHIC ATTRIBUTES CODED TO THEM BY A PROCESS CALLED "TAGGING."

25



TO BUILD THE COMPUTER-READABLE MAP BASE REQUIRED FOR AUTOMATING THE GEOGRAPHIC SYSTEM, THE GEOGRAPHY DIVISION HAD GROUPS OF PEOPLE LOOKING AT AVAILABLE COMPUTER SYSTEMS FOR PROCESSING GEOGRAPHIC INFORMATION, WHAT OTHER FEDERAL AND STATE MAP MAKING AGENCIES WERE DOING TO SOLVE THEIR PROBLEMS, WHAT SATELLITE TECHNOLOGY HAD TO OFFER, AND SO FORTH.

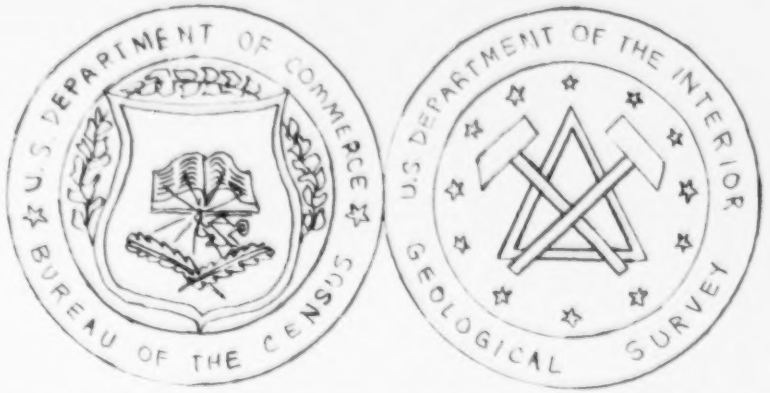
26



THESE STUDIES EVEN CONSIDERED TRYING TO DO THE WHOLE JOB OF AUTOMATING THE MAPS FROM SCRATCH. BUT EVEN USING THE LATEST EQUIPMENT FOR DIGITIZING, WHICH CONVERTS INDIVIDUAL LINE SEGMENTS ON MAPS INTO COMPUTER READABLE FORM, OPERATOR ENTRY OF ALL OF THE LINE SEGMENTS FORMING ALL MAP FEATURES FOR THE ENTIRE COUNTRY WOULD TAKE MANY YEARS.

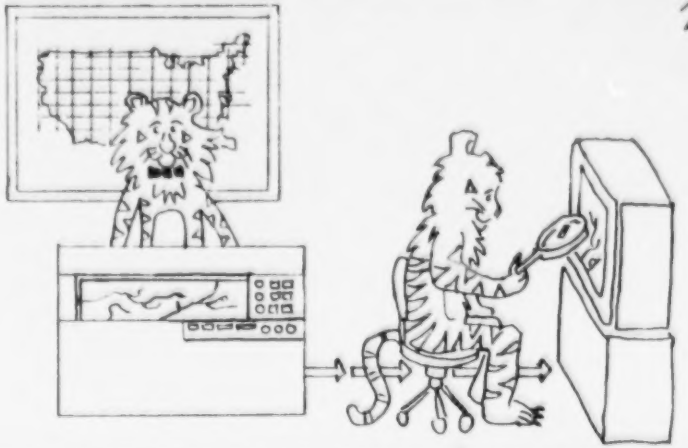
WORKING WITH THE U.S. GEOLOGICAL SURVEY....

27



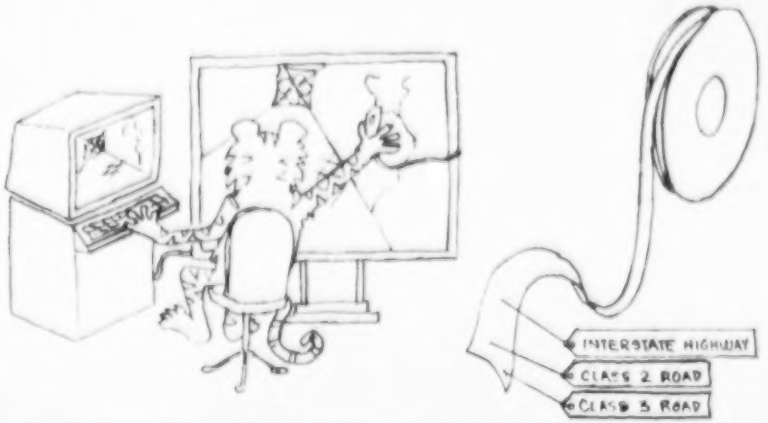
AS A RESULT OF ALL THIS RESEARCH, THE GEOGRAPHY DIVISION RECOMMENDED THAT THE CENSUS BUREAU ENTER INTO A COOPERATIVE AGREEMENT WITH THE U.S. GEOLOGICAL SURVEY, ANOTHER FEDERAL AGENCY THAT ALSO HAD AN INTEREST IN DEVELOPING A COMPUTER-READABLE MAP FILE FOR THE WHOLE UNITED STATES. UNDER THE TERMS OF THIS HISTORIC AGREEMENT, THE TWO AGENCIES WILL WORK TOGETHER ON THIS MASSIVE TASK TO AVOID DUPLICATION OF WORK AND COSTS AND TO PROVIDE THE MOST COMPLETE AND ACCURATE SET OF MAPS EVER PREPARED FOR THE U.S.--AND THE FIRST SET FROM A COMPUTER FILE.

28



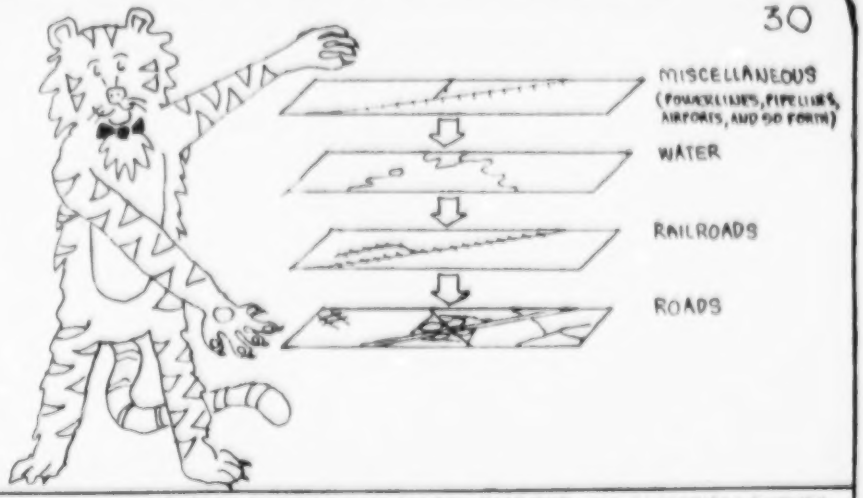
THE MAP BASE FOR THE LOWER 48 STATES PLUS THE DISTRICT OF COLUMBIA IS BEING PREPARED BY THE U.S. GEOLOGICAL SURVEY. THEY ARE USING AUTOMATED SCANNING EQUIPMENT TO CAPTURE LINE INFORMATION FROM THEIR 1:100,000-SCALE NATIONAL MAP SERIES. THE SEPARATE LAYERS USED TO MAKE EACH MAP (ROADS, WATER, RAILROADS, AND MISCELLANEOUS TRANSPORTATION) ARE PLACED ON A ROTATING DRUM WHERE ALL FEATURES SHOWN ON THE BASE MAPS ARE "READ" INTO DIGITAL FORMAT BY REFLECTED LIGHT. THE RESULTING COMPUTER FILES ARE CAREFULLY EDITED BEFORE BEING SENT TO THE CENSUS BUREAU. ALL OF THESE MAPS WILL BE PROCESSED BY 1987.

29



THE INITIAL CENSUS BUREAU FILE BUILDING TASK IS TO USE ITS DIGITIZING EQUIPMENT TO ENTER ROAD TYPE CODES (FREEWAY, CITY STREET, JEEP TRAIL, AND SO FORTH) INTO EACH U.S.G.S. FILE BY TAGGING EACH ROAD SEGMENT WITH AN ATTRIBUTE CLASS CODE. ONLY THE ROAD LAYER OF EACH U.S.G.S. 100K MAP FILE IS SENT TO THE BUREAU OF THE CENSUS AT THIS TIME. AT THE SAME TIME, THE GEOLOGICAL SURVEY IS TAGGING THE WATER, RAILROAD, AND MISCELLANEOUS FILES FOR EACH MAP SHEET.

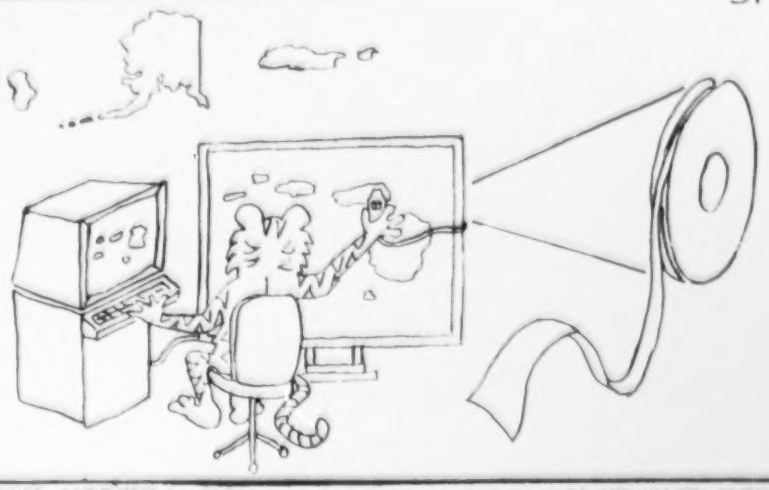
30



ONCE THE CENSUS BUREAU RETURNS EACH TAGGED ROAD FILE, THE GEOLOGICAL SURVEY PUTS ALL FOUR COMPUTER FILES FOR EACH MAP SHEET INTO ITS NATIONAL DIGITAL CARTOGRAPHIC DATA BASE. AT THE SAME TIME, IT RETURNS THE ROAD FILE TO THE CENSUS BUREAU ALONG WITH THE THREE OTHER LAYERS FOR EACH SCANNED 1:100,000 SCALE MAP: WATER, RAILROADS, AND MISCELLANEOUS TRANSPORTATION. THE CENSUS BUREAU THEN "SANDWICHES" THESE LAYERS AND ALIGNS ALL FEATURES ALONG THE MAP EDGES; THIS PROCESS IS CALLED "VERTICAL INTEGRATION."

IMPROVING THE MAP BASE....

31



TO PROVIDE COMPUTER-READABLE MAP COVERAGE FOR THE REST OF THE UNITED STATES AND ITS TERRITORIES, THE CENSUS BUREAU IS USING ITS OWN DIGITIZING EQUIPMENT TO CAPTURE THE NECESSARY INFORMATION OFF OF PRINTED MAPS, OFTEN MAPS FROM THE U.S. GEOLOGICAL SURVEY.

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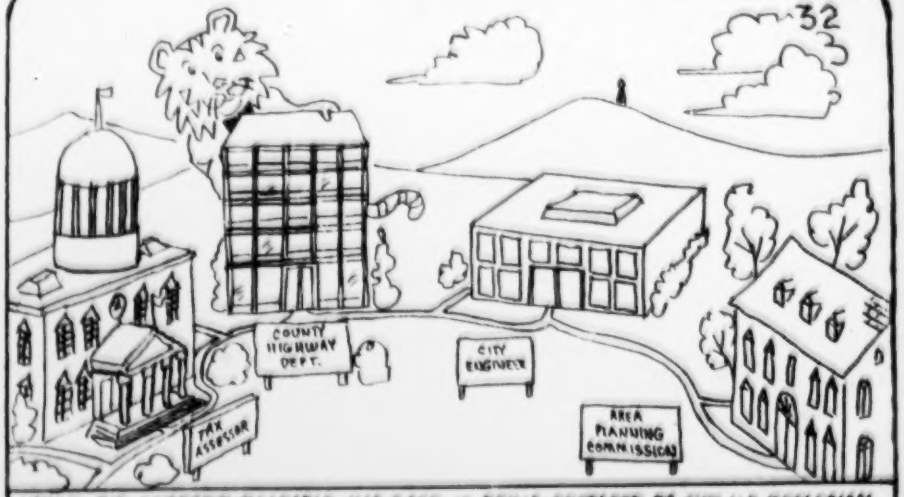
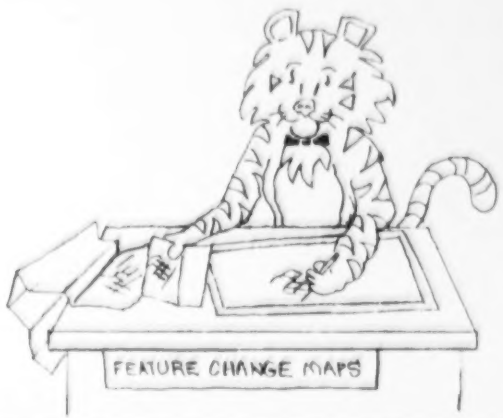


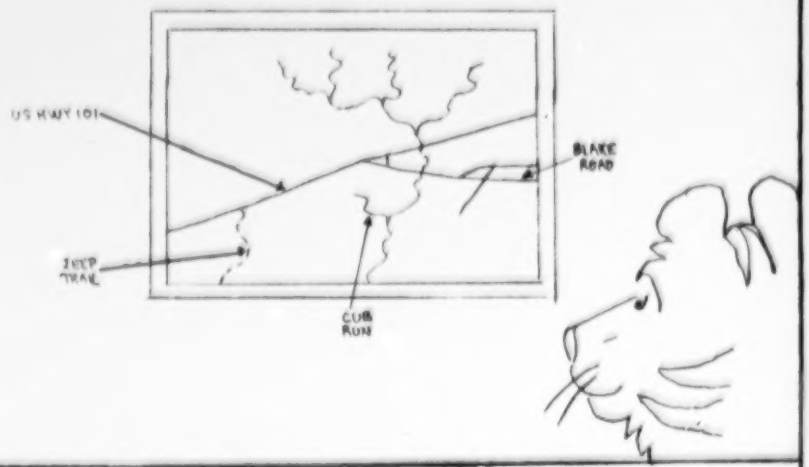
WHILE THE COMPUTER-READABLE MAP BASE IS BEING PREPARED BY THE U.S. GEOLOGICAL SURVEY AND STAFF AT CENSUS BUREAU HEADQUARTERS, A GEOGRAPHIC STAFF IN THE CENSUS BUREAU'S 12 REGIONAL OFFICES IS BUSY GATHERING INFORMATION ABOUT WHERE NEW ROADS ARE BEING BUILT AND WHAT THE NAMES ARE FOR ALL THE EXISTING ROADS, RIVERS, RAILROADS, AND SO FORTH. THE GEOGRAPHERS ARE WORKING WITH CITY, COUNTY, AND STATE OFFICIALS TO IDENTIFY SOURCES FOR THIS INFORMATION.

33



USING THESE LOCALLY SUPPLIED REFERENCE MAPS, THE REGIONAL OFFICE GEOGRAPHIC STAFF MAKES UPDATES ON PAPER COPIES OF THE PRINTED 1:24,000 MAP SERIES FROM THE U.S. GEOLOGICAL SURVEY. THIS PROCESS IS CALLED THE FEATURE CHANGE MAP OR FCM UPDATE OPERATION. APPROXIMATELY ONE-THIRD OF ALL MAPS FOR THE UNITED STATES WILL BE UPDATED EACH YEAR IN THIS WAY; THE FIRST THIRD WAS DONE BY THE END OF 1984.

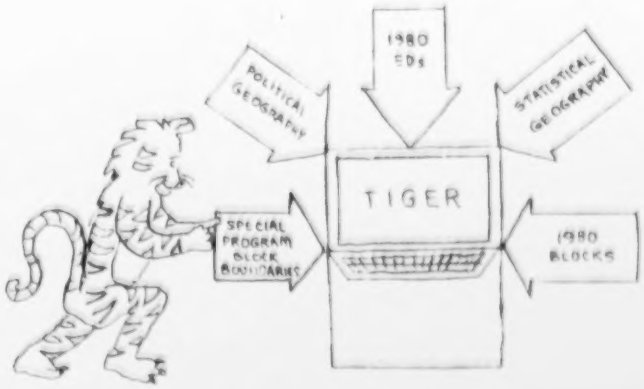
34



FOUR OF THE CENSUS BUREAU'S REGIONAL OFFICES (BOSTON, MA, ATLANTA, GA, DALLAS, TX, AND DENVER, CO) HAVE BEEN DESIGNATED AS FIELD DIGITIZING SITES. THESE FOUR OFFICES WILL ENHANCE THE COMPUTER-READABLE MAP BASE FROM THE U.S. GEOLOGICAL SURVEY BY DIGITIZING IN THE ADDITIONAL INFORMATION CONTAINED ON THE FCMS. THIS INCLUDES ALL NEW FEATURES ADDED SINCE THE 1:100,000-SCALE MAP WAS COMPILED, AND THE FEATURE NAMES

ADDING GEOGRAPHIC REFERENCE INFORMATION....

35



ONCE THE MAP BASE IS COMPLETED, THE GEOGRAPHIC AREA INFORMATION CAN BE ADDED IN PROPER RELATIONSHIP TO THE STREETS ALONG WHICH HOUSES AND BUSINESSES ARE LOCATED. CURRENT PLANS CALL FOR STARTING THIS PROCESS BY INSERTING THE 1980 AREA IDENTIFIERS AT THE CENSUS BUREAU'S DATA PREPARATION DIVISION IN JEFFERSONVILLE, IN. THE 1980 IDENTIFIERS WILL BE CORRECTED WHERE ERRORS HAVE BEEN REPORTED, AND WILL COME FROM THE 1980 ARF TO AVOID THE NEED FOR MASSIVE CLERICAL PROCESSING. THIS PROCESS IS SCHEDULED TO BEGIN IN 1985 AND CONTINUE THROUGH 1987.

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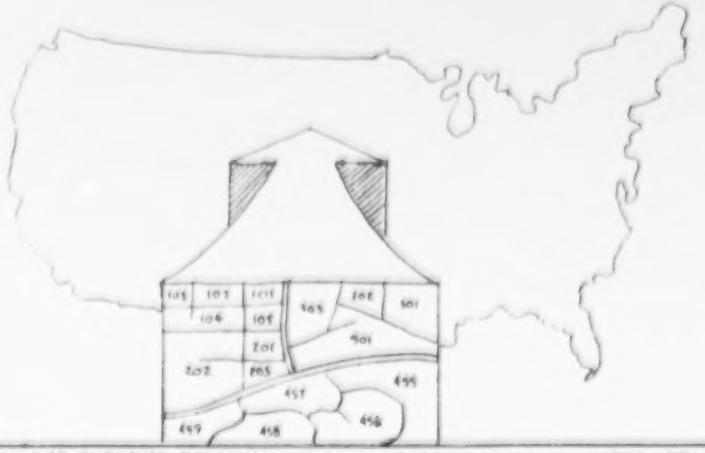
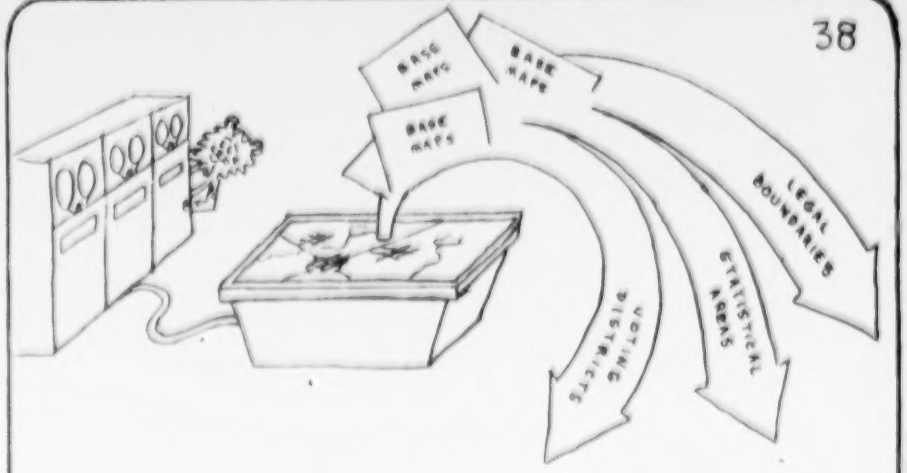
FOR CERTAIN POLITICAL AND LEGAL AREAS, THE CENSUS BUREAU WILL BEGIN INSERTING GEOGRAPHIC AREA IDENTIFIERS WHERE THEY ARE KNOWN TO BE DIFFERENT THAN THE 1980 LOCATION. THIS IS DONE USING REVISIONS TO THE 1980 BOUNDARIES REPORTED BY LOCAL OFFICIALS OR OTHER APPROPRIATE ORGANIZATIONS. MOST BOUNDARIES DO NOT CHANGE.

37



NEXT, THE CENSUS BUREAU'S REGIONAL OFFICE GEOGRAPHIC STAFF WILL WORK WITH LOCAL CENSUS STATISTICAL AREAS COMMITTEES TO REVIEW THE 1980 CENSUS TRACT PLANS AND REVISE THEM AS REQUIRED FOR 1990. WHERE CENSUS TRACTS ARE NOT DEFINED, THE REGIONAL OFFICE GEOGRAPHIC STAFF WILL WORK WITH APPROPRIATE STATE AND LOCAL OFFICIALS TO DEFINE CENSUS BLOCK NUMBERING AREAS. WITHIN THIS FRAMEWORK, THE CENSUS BUREAU WILL ASSIGN 1990 BLOCK NUMBERS ACROSS THE ENTIRE NATION, RETAINING 1980 NUMBERS WHERE POSSIBLE. NATIONWIDE BLOCK NUMBERING IS REQUIRED FOR FIELD OPERATIONS.

38



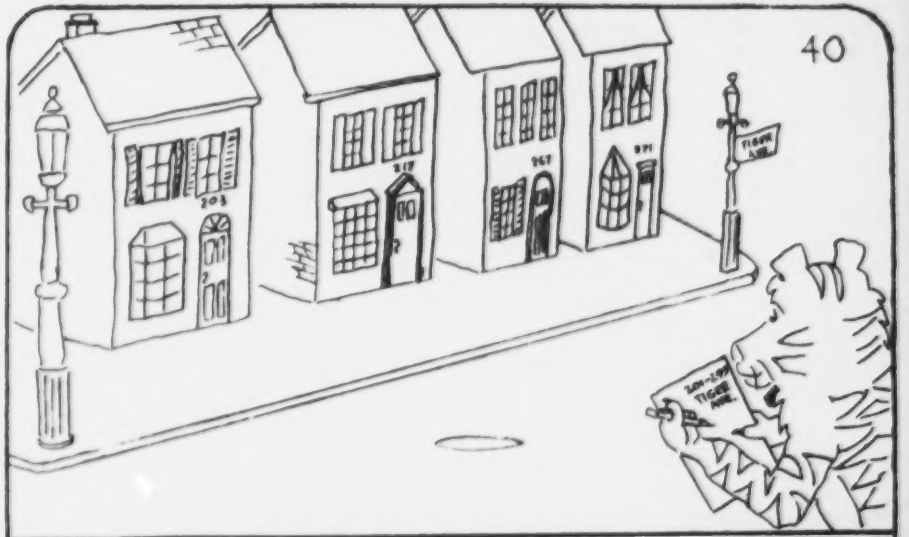
ONCE THE GEOGRAPHIC AREA BOUNDARIES HAVE BEEN INSERTED, THE TIGER FILE IS IN A FORM THAT MAPS CAN BE PRODUCED BY COMPUTER-DRIVEN PLOTTERS FOR THE COLLECTION OF OTHER TYPES OF BOUNDARY INFORMATION -- ADDITIONAL CHANGES IN LEGAL BOUNDARIES, OTHER STATISTICAL AREAS, THE P.L. 94-171 PROGRAM TO RECOGNIZE VOTING DISTRICTS, AND SO FORTH.

INSERTING ADDRESS REFERENCE INFORMATION....

39

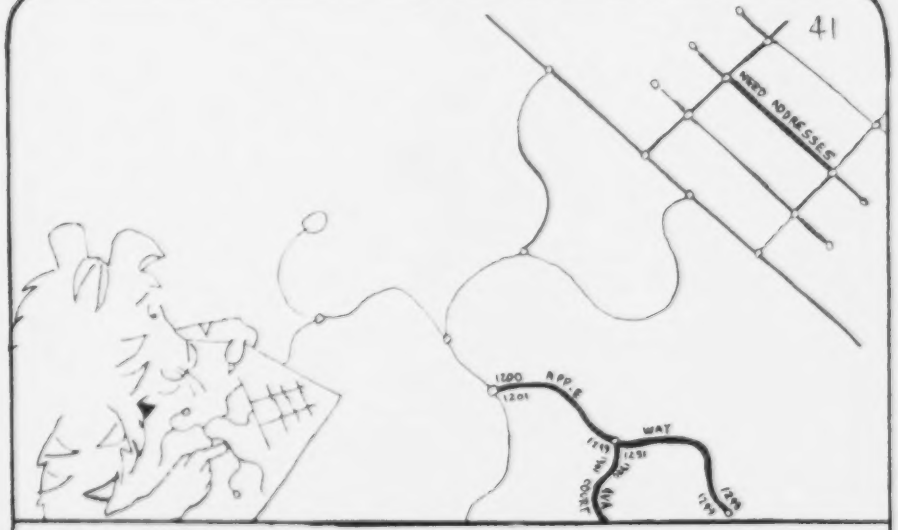
DURING THE TIME WHEN THE GEOGRAPHIC REFERENCE INFORMATION IS BEING ADDED TO THE TIGER FILE, THE REGIONAL OFFICE GEOGRAPHIC STAFF WILL BE GATHERING ADDRESS REFERENCE SOURCE INFORMATION FROM LOCAL OFFICIALS.

40



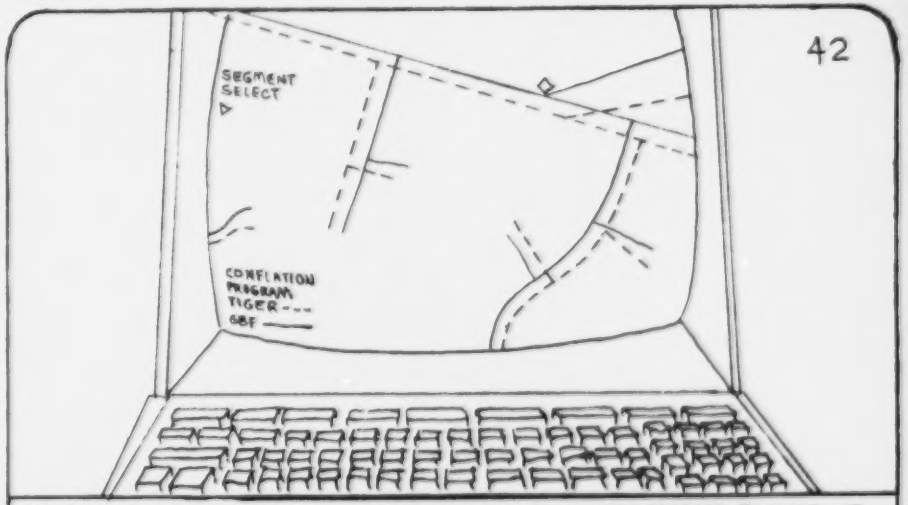
IN AREAS NOT ALREADY COVERED BY GBF/DIME-FILES, THE ADDRESS REFERENCE SOURCES WILL BE USED TO INSERT THE LOWEST AND HIGHEST ADDRESS NUMBERS POSSIBLE FOR EACH BLOCK SIDE INTO THE TIGER FILE.

41



IN AREAS WHERE GBF/DIME-FILES EXIST, THE ADDRESS REFERENCE SOURCES WILL BE USED TO INSERT ADDRESS RANGES WHERE NEW FEATURES HAVE BEEN ADDED AND TO CHECK EXISTING FEATURES THAT HAVE INADEQUATE ADDRESS RANGE INFORMATION (O-D, ADDRESS EDIT INCONSISTENCIES, AND SO FORTH).

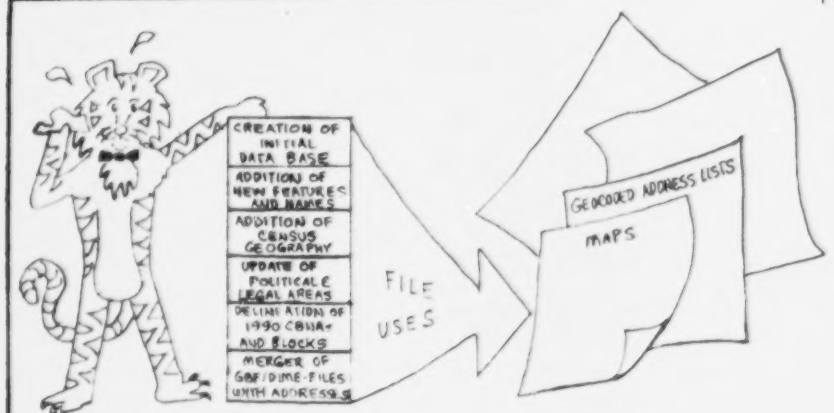
42



AFTER THE GBF/DIME-FILES HAVE BEEN UPDATED, ALL OF THE ADDRESS REFERENCE INFORMATION WILL BE TRANSFERRED TO THE TIGER FILE USING AN AUTOMATED PROCESS CALLED "CONFLATION." IN THIS PROCESS, THE COMPUTER ALIGNS THE FEATURES IN THE TIGER FILE WITH THE COMPARABLE FEATURES IN THE GBF/DIME-FILE AND THEN TRANSFERS THE BLOCK SIDE/ADDRESS RANGE RELATIONSHIP TO THE TIGER FILE. IN THIS WAY, THE SIGNIFICANT INVESTMENT MADE IN PREPARING THE GBF/DIME-FILES FOR 1980 IS CARRIED FORWARD.

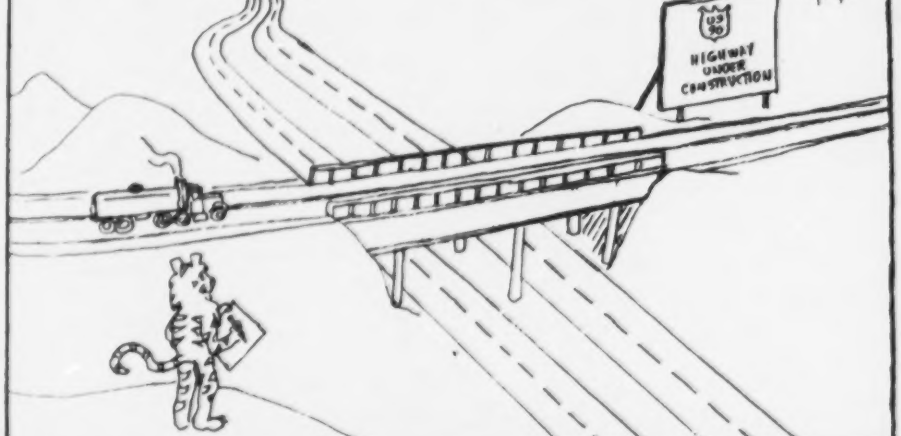
PRECENSUS USE AND IMPROVEMENT....

43


CREATION OF INITIAL DATA BASE
ADDITION OF NEW FEATURES AND NAMES
ADDITION OF CENSUS GEOGRAPHY
UPDATE OF POLITICAL & LEGAL AREAS
DELINEATION OF 1990 CENSUS BLOCKS
MERGER OF GBF/DIME-FILES WITH ADDRESSES
FILE USES
GEOCODED ADDRESS LISTS
MAPS

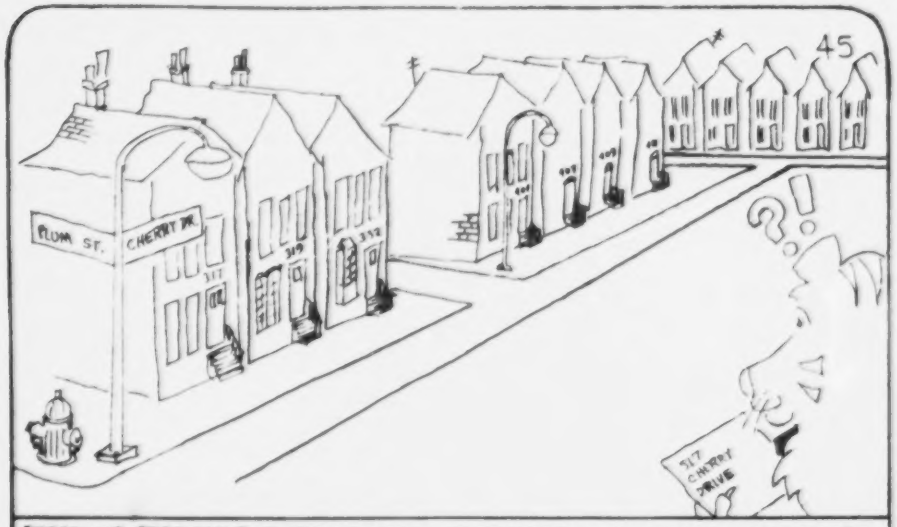
AT THIS POINT, NEAR THE END OF 1987, THE MAJOR STEPS IN THE INITIAL TIGER FILE BUILDING PROCESS WILL BE COMPLETE. FILE USES WILL BEGIN WITH PRODUCTION OF COMPUTER MAP PLOTS AND OTHER MATERIALS FOR PRECENSUS FIELD OPERATIONS AND FOR GEOCODING OF THE PRECENSUS ADDRESS LIST.

44



PRECENSUS FIELD OPERATIONS PROVIDE THE OPPORTUNITY FOR A 100 PERCENT VERIFICATION OF THE MAP FEATURES AND THEIR NAMES IN THE TIGER FILE. CORRECTIONS THAT ARE NOTED BY FIELD STAFF WILL BE INSERTED INTO THE TIGER FILE BEFORE IT IS USED TO PREPARE MATERIALS FOR 1990 CENSUS OPERATIONS. IN THIS WAY THE VERY LATEST STREET DEVELOPMENTS AND NAME CHANGES WILL BE ADDED TO THE FILE; AN OPTION THAT DID NOT EXIST WITH THE HAND-DRAFTED MAPS OF 1980.

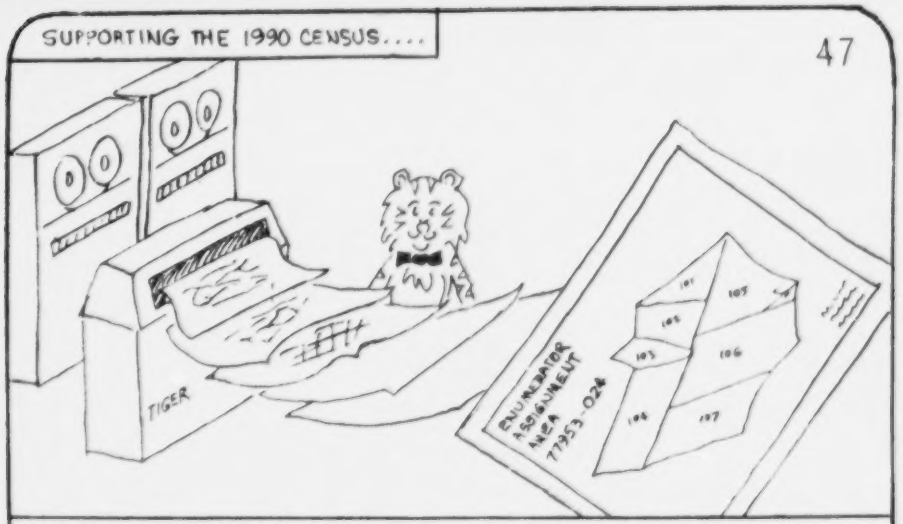
45



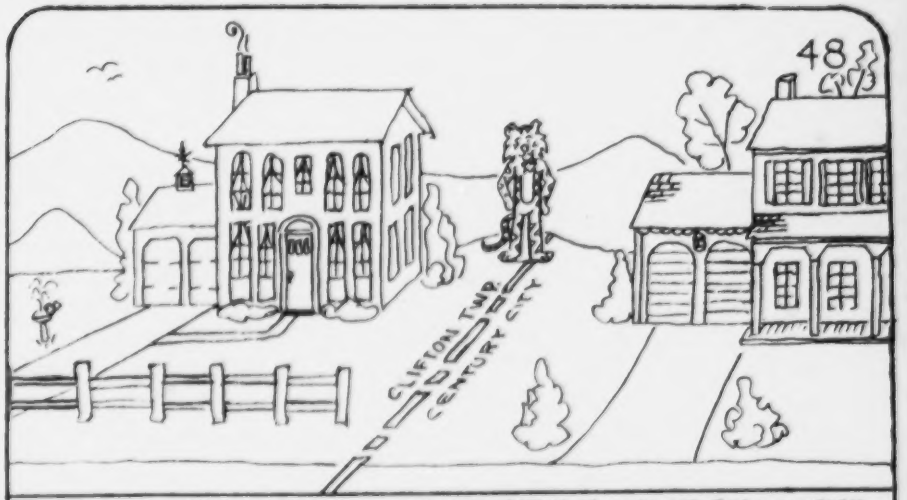
PRECENSUS PROCESSING OF THE ADDRESS LIST PROVIDES AN ADDITIONAL OPPORTUNITY TO IMPROVE THE TIGER FILE AND THE ADDRESS LIST. WHERE ADDRESSES DO NOT FIT WITHIN THE ADDRESS RANGES IN THE TIGER FILE, FIELD CHECKING WILL DETERMINE IF FURTHER TIGER FILE UPDATING IS NECESSARY OR IF THERE IS A DEFICIENCY IN THE ADDRESS LIST. THIS PROCESS WAS NOT DONE IN 1980.

46

FINALLY, THE EXPECTED PRECENSUS LOCAL REVIEW OPERATION PROVIDES A THIRD OPPORTUNITY TO IDENTIFY AND CORRECT DEFICIENCIES IN THE TIGER FILE AND THE ADDRESS LIST. WHEN LOCAL OFFICIALS REVIEW THE HOUSING UNIT COUNTS AND THE MAPS, THEY CAN DESCRIBE WHERE THE FIELD CHECKS AND PRECENSUS GEOCODING HAVE NOT CORRECTED ALL INFORMATION. WHILE FEW PROBLEMS SHOULD REMAIN AT THIS POINT, THE LOCAL REVIEW IS AN IMPORTANT PART OF THE OVERALL IMPROVEMENT PLANNED FOR THE 1990 GEOGRAPHIC SYSTEM.

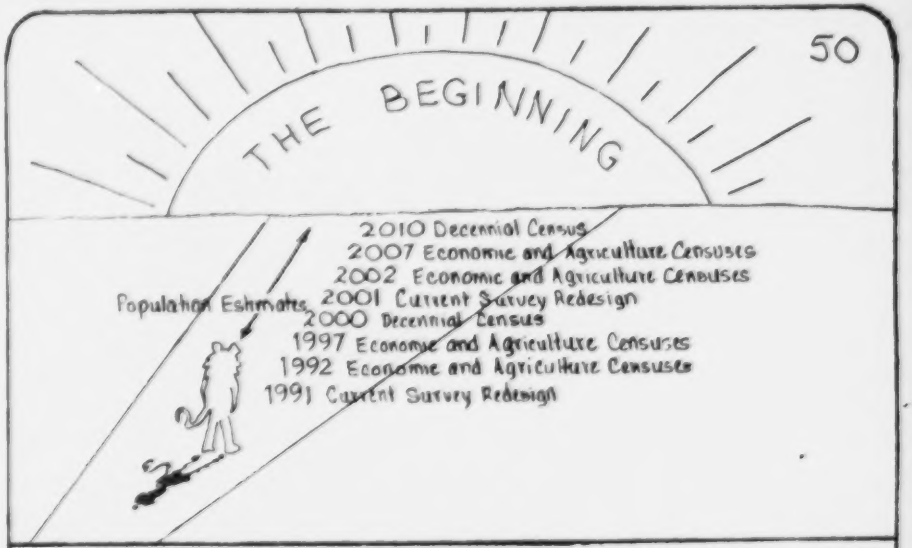


ONE OF THE PRIMARY 1990 GEOGRAPHIC SUPPORT ACTIVITIES IS PREPARING MAPS OF ENUMERATOR ASSIGNMENT AREAS. THE FULL POWER OF AUTOMATION IS MOST EVIDENT IN THIS PROCESS BECAUSE THE COMPUTER-DRIVEN PLOTTERS CAN TAILOR EACH MAP TO FIT THE REQUIREMENTS OF FIELD OPERATIONS. NO LONGER WILL MAPS BE TOO LARGE OR TOO SMALL BECAUSE CUMBERSOME REPRODUCTION PROCESSES WOULD NOT ALLOW RAPID PRODUCTION OF APPROPRIATELY SIZED MAPS.



HAVING THE GEOGRAPHIC AREA BOUNDARY INFORMATION IN COMPUTER-READABLE FORM WELL IN ADVANCE OF THE CENSUS ALLOWS SIGNIFICANTLY MORE TIME TO DETERMINE THE CORRECT RELATIONSHIP OF HOUSES NEAR THE BOUNDARY TO THE CENSUS GEOGRAPHY. IN ADDITION, WHERE BOUNDARIES SELDOM CHANGE, THIS EARLY ALLOCATION OF HOUSES TO THE CORRECT TABULATION AREA REDUCES THE NUMBER OF INSTANCES REQUIRING RESEARCH AT THE CRITICAL TIME WHEN CENSUS OFFICES NEED TO CLOSE.

FINALLY, THE TIGER SYSTEM WILL BE USED TO PRODUCE PUBLICATION QUALITY MAPS ON HIGH PRECISION COMPUTER-DRIVEN MAP PRODUCTION DEVICES TO ACCOMPANY THE DATA FILES FOR THE CENSUS BUREAU'S 1990 DECENNIAL PUBLICATION PROGRAMS.



OF COURSE, THE STORY OF THE TIGER DATA BASE DOES NOT END HERE. THE SYSTEM WILL BE UPDATED CONTINUALLY, REFINED, AND ENHANCED TO SERVE THE CENSUS BUREAU'S AND THE PUBLIC'S NEED FOR ACCURATE, TIMELY GEOGRAPHIC PRODUCTS IN THE DECADES AHEAD.

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